

$$① \quad {}^{25}_2P_2 = 62.250$$

$$② \quad {}^nC_r = \frac{n!}{r!(n-r)!} = {}^5C_2 = 10$$

$$③ \quad 2^3 = 8$$

$$④ \quad {}^{30}C_3 = 4060$$

$$⑤ \quad {}^6C_3 = 20$$

$$⑥ \quad \text{prop of seven} = ⑥ \rightarrow \text{5 of dice}$$

$$\{1, 2, 3, 4, 5, 6\}$$

$$⑦ \quad 3 \text{ books from 6} \rightarrow {}^6C_3 = 20$$

$$3 \text{ book from 4} \rightarrow {}^4C_3 = 4$$

$$2 \text{ cases} \rightarrow {}^2C_1 = 2$$

$$\text{result} = 20 + 4 + 2 = 18$$

$$⑧ \quad {}^{20}C_9 = 167960$$

$$⑨ \quad {}^2C_2 \times {}^2C_2 \times {}^2C_2 \times {}^2C_2 \times {}^{20}C_4 = 4845$$